DRAFT ENVIRONMENTAL ASSESSMENT

OPENING WATERFOWL HUNTING ON 5, 500 ACRES OF FORMER COMMERCIAL SALT PONDS

DON EDWARDS SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE ALVISO AND RAVENSWOOD SALT PONDS

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Chapter I: PURPOSE OF AND NEED FOR ACTION

A. Introduction and Background

During 1972, Congress passed Public Law 92-330 which provided for the establishment of the San Francisco Bay National Wildlife Refuge (Refuge)**:** "...for the preservation and enhancement of highly significant habitat...for the protection of migratory waterfowl and other wildlife, including species known to be threatened with extinction, and to provide opportunity for wildlife oriented recreation and nature study..." 86 Stat 399, dated June 30, 1972. In March 2003, the Refuge acquired in fee title from Cargill, Inc. approximately 5,500 acres of land (which included approximately 5,000 acres of open water ponds) which are located in Alameda, Santa Clara and San Mateo Counties in the South San Francisco Bay, California (Figure 1).

This acquisition included ponds in the Refuge's Alviso Unit, the Mowry Slough Unit and the Ravenswood Unit. Specifically, the following ponds were acquired in fee title and are included in this environmental assessment: Alviso Unit ponds A1, A2W, AB1, A2E, AB2, A3N, A3W, A5, A7, and A8; Mowry Slough Unit ponds A22 and A23 (eastern portions only; the western portions were already owned by the Refuge); and Ravenswood Unit ponds SF-2, R3, R4, R5 and RS5 (Figure 1). The lands covered in this environmental assessment are former commercially operated salt ponds surrounded by upland levees that were operated and maintained by Cargill Salt Division. Thin strips of tidal marsh occur along the outside base of the levees and in the slough channels between some of the levees (Permanente Creek, Stevens Creek, Guadalupe Slough, and Alviso Slough). Areas outside the levees (salt marshes) are generally not part of the purchased lands and are not subject to the proposed hunting program.

The Refuge purchased 5,500 acres of Cargill land in fee title. Approximately 5,000 acres are pond area and approximately 500 acres are upland areas such as pond levees and small pieces of adjacent mudflats and creeks that were not considered for inclusion in the hunt program.

Waterfowl hunting is a common and accepted recreational activity on many units of the National Wildlife Refuge System. Currently, approximately 7,663 acres of the Refuge (25%) (Figure 1) are open to waterfowl hunting including salt ponds similar to those being considered for hunting under this assessment, and 22,337 acres (75%) serve as sanctuary. Opportunities to hunt waterfowl in South San Francisco Bay outside the Refuge are limited. The nearest areas open to hunting have been the State and Federal lands (San Pablo Bay National Wildlife Refuges) in the North San Francisco Bay (1.5 hour drive) with more extensive hunting opportunities in the Sacramento – San Joaquin Delta and the Central Valley (2.5 to 5 hour drive). The California Department of Fish and Game is also considering opening a portion of the commercial salt ponds (Baumberg

Area near the east side of the San Mateo Bridge in Alameda County) that they purchased from Cargill to waterfowl hunting. They opened a portion of their ponds in January 2004 to hunting for one day under a lottery basis. They may permit hunting in the future (personal communication, John Kraus, CDFG). Like many of the former Cargill commercial salt ponds acquired by the Refuge, the CDFG ponds were hunted for many decades under Cargill ownership through the 2002-2003 hunt season.

Under Cargill's ownership, approximately 3,328 acres of the recently purchased ponds were open to waterfowl hunting through a system of private leases and subleases. The following Alviso Ponds were hunted historically under Cargill's ownership: A1, A2W, AB1, A2E, AB2, A3N, A3W, A5, A7, and A8. Ponds A22 and A23, and the Ravenswood Ponds were not open to hunting under Cargill ownership. Since the purchase of the ponds, waterfowl hunting has ceased pending the amendment of the Refuge Hunt Plan Amendment, a compatibility determination, this environmental assessment, concurrence from the State, Section 7 of the Endangered Species Act consultation and publication of regulations specific to waterfowl hunting of this area in the Federal Register. The Refuge has received numerous phone calls, letters and comment at public meetings requesting resumption of hunting on these ponds. The Refuge has also received comment that hunting should not be allowed on these ponds and should be stopped on all Refuge lands.

The National Wildlife Refuge System Administration Act of 1966 as amended (Act) by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the Service to manage the Refuge and its wildlife populations. In addition the Act as amended declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the Refuge System that are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation. It directs managers to increase recreational opportunities including hunting on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

B. Purpose and Need

The purpose is to consider providing quality waterfowl hunting on appropriate portions of the recently acquired former commercial salt ponds on the Refuge in South San Francisco Bay. The need is for compatible wildlife-dependent waterfowl hunting in an area that has been hunted historically and has substantial demand for this activity in South San Francisco Bay.

Chapter II: ALTERNATIVES INCLUDING THE PROPOSED ACTION

Three alternatives have been considered for waterfowl hunting on the recently acquired ponds on the Refuge. The Alternatives are: 1) No Action which maintains the current no hunting status of the ponds, 2) Waterfowl Hunting Confined to Certain Ponds (Proposed Action) which opens some of the ponds to waterfowl hunting, and 3)Waterfowl Hunting on All Ponds which opens all the ponds to waterfowl hunting.

Alternative 1: No Waterfowl Hunting on Salt Ponds (No Action). Though some of the 5,000 acres* of former commercial salt ponds were open to private leaseholder hunting under Cargill ownership, none of the ponds have been open to waterfowl hunting since the Refuge purchased them in March, 2003. Under this alternative, the ponds would continue to be closed to waterfowl hunting. As with the other two alternatives, the Refuge would continue to be closed to all other forms of hunting, target shooting, or training of dogs in Alternative 1.

* Refuge purchased 5,500 acres of Cargill land in fee title. Approximately 5,000 acres are pond area and approximately 500 acres are upland areas such as pond levees and small pieces of adjacent mudflats and creeks that were not considered for inclusion in the hunt program. 7,663 acres (25%) would continue to be open to hunting on other sections of the Refuge and 22,337 acres (75%) would be closed to hunting serving as sanctuary.

Alternative 2: Waterfowl Hunting Confined to Certain Ponds (Proposed Action). Ponds AB1, A2E, AB2, A3N, A3W, A5, A7 and A8N would be open to waterfowl hunting three days a week for a total of approximately 2,622 acres. Ponds A1, A2W, A8S, A22, A23, R3, R4, R5, SF-2 and S5 would be closed to waterfowl hunting for a total of approximately 2,378 acres (Figure 1). (See Appendix C for the Hunt Plan Amendment). A total of 10,900 acres (36%) of the Refuge would be open to hunting and 19,100 acres (64%) would be closed to hunting serving as sanctuary. The use of retrieving dogs would be permitted and encouraged in all areas open to waterfowl hunting. These dogs would be required to be under control at all times. They would be in a vehicle or on a leash until they are on the ponds as a part of the hunt or on the levees (Ponds A5, 7 and 8N only) as a part of the hunt. A Refuge Special Use Permit would be required for hunting of the ponds in this alternative. An annual fee would be charged which would cover, hunting on the ponds, use of existing hunt blinds, and use of boats on the ponds.

Ponds A5, A7 & A8N:

Waterfowl hunting of Salt Ponds A5, A7 and A8N would be permitted on Saturdays, Sundays and Wednesdays on a walk in basis. Hunters would be allowed to enter the pond

system from Gold Street in Alviso (Figure 6). The Gold Street gate would be opened one hour before the start of shoot time and closed one hour after end of shoot time. Parking would be at the designated parking lot and along Gold Street. Hunters would be able to hunt from the levees and use small private boats to reach blinds in the ponds. Under the provisions of the Special Use Permit, these private boats would be placed in the ponds before the hunting season, must be left in the ponds during the season and removed after the hunting season. The boats would be either non motorized or electric motors. The existing blinds could be maintained by private parties with Refuge Special Use Permits but must be open to all hunters on a first come, first use basis. No new blinds would be allowed

Ponds AB1, A2E, AB2, A3N, and A3W:

Hunting in these ponds would be the same as described above for Ponds A5, A7, and A8N except access would be restricted to use of motor vehicles driven to the small private boats in the ponds and hunting would only be allowed from existing blinds in the ponds. Hunting would not be allowed from levees. Access to Ponds AB1 and A2E would be by motor vehicles from the end of Crittenden Lane in Mountain View (Figure 4), across the bridge over Stevens Creek and along the East Levee to the boats moored on the Refuge ponds. Access to Pond A3W would be from the end of Carl Road in Sunnyvale (Figure 5) to the Cargill levee road along the A3W/A4 channel to the boats moored on the Refuge pond. Access to Ponds AB2 and A3N would be by boat from AB1, A2E or A3W (Figure 3). Vehicle access would be restricted to those days that the levees are dry enough to be driven safely and prevent damage to the levees. If the access levees are too wet, the ponds would not be open to hunting. These gates would be opened one hour before the start of shoot time and closed one hour after end of shoot time.

Under this Alternative, a monitoring program would be implemented to determine hunter density and wildlife use of the subject ponds. If hunter density grows to negatively impact the quality of the hunt as based on Refuge Manger judgment, the Refuge would institute a lottery system to reduce the number of hunters using the ponds. If this does not address the issue, this plan would be reassessed.

The Refuge would maintain an active law enforcement presence by using Refuge Officers and California Department of Fish and Game Wardens to ensure public compliance with the hunting regulations and the stipulations presented herein. The Refuge would increase law enforcement patrols especially during the opening weeks of the season to document hunter use and ensure compliance with Refuge regulations. Refuge Officers would also record harvest information and impacts to non-huntable wildlife. In addition to law enforcement activity, the Refuge would continue Mid-winter waterfowl surveys, snowy plover surveys and USGS pond surveys to provide additional information to the Refuge Manager. The Manager would continue to be in contact with local governments adjacent to the proposed hunt areas to determine if there are any conflicts with existing users.

Salt Ponds A1, A2W, A8S, A22, A23, R3, R4, R5, SF-2 and RS5:

The following ponds would be closed to public use: Salt Ponds A1, A2W, A8S, A22, A23, R3, R4, R5, SF-2 and RS5. Of these ponds, only A1 and A2W were open to hunting under Cargill ownership, (Figure 2).

Alternative 3: Waterfowl Hunting on All Ponds. All ponds would be open to waterfowl hunting, seven days a week: Ponds A1, A2W, AB1, A2E, AB2, A3N, A3W, A5, A7, A8N, A8S, A22, A23, R3, R4, R5, SF-2 and S5 for a total of approximately 5,000 acres (Figure1). A total of 12,663 acres (42%) of the Refuge would be open to hunting and 17,337 acres (58%) would be closed to hunting serving as sanctuary. The use of retrieving dogs would be permitted and encouraged in all areas open to waterfowl hunting. These dogs would be required to be under control at all times. They would be in a vehicle or on a leash until they are on the ponds as a part of the hunt or on the levees (Ponds A5, 7 and 8N only) as a part of the hunt. A Refuge Special Use Permit would be required for hunting of the ponds in this alternative. An annual fee would be charged which would cover, hunting on the ponds, use of existing hunt blinds, and use of boats on the ponds. Hunting would only be allowed from hunting blinds except Ponds 5, 7, and 8N where hunting would also be allowed from levees,

Under the provisions of the Special Use Permit, private boats would be used to reach hunting blinds in the ponds. They would be placed in the ponds before the hunting season, must be left in the ponds during the season and removed after the hunting season. The boats would be either non motorized or electric motors. The existing blinds could be maintained by private parties with Refuge Special Use Permits but must be open to all hunters on a first come, first use basis. New blinds would be allowed on those ponds that do not currently have blinds (A8S, A22, A23, R3, R4, R5, SF-2 and S5). These blinds would only be built of material approved by the Refuge under the Special Use Permit

On a walk in basis, waterfowl hunting of Salt Ponds A5, A7, A8, A22, A23, R3, R4, R5, SF-2 and S5 would be permitted seven days a week. Hunters would be allowed to enter the A5, A7, and A8 pond system from Gold Street in Alviso (Figure 3). They would be able to access Ponds A22 and A23 from the Refuge gate off Cushing Parkway in South Fremont (Figure 3). Access to Ponds R3, R4, R5 and S5 would be through the Refuge gate on Bayfront Expressway in Menlo Park (Figure 3). Access to Pond SF2 would be off the access road just south of the west end of the Dumbarton Bridge, Highway 84. These gates would be opened one hour before the start of shoot time and closed one hour after end of shoot time.

Under this Alternative, the Hunting Program would be monitored by taking information on number of hunters and harvest information conducted by Refuge law enforcement staff. Enforcement staff would also monitor for compliance with laws and regulations, and impacts to non-huntable wildlife. The Refuge managers would continue to be in contact with local governments adjacent to the proposed hunt areas to determine if there are any conflicts with existing users. The Refuge conducts snowy plover surveys and would close any ponds to hunting that contain this species. The Refuge would continue to inventory bird populations through USGS pond surveys and the mid-winter waterfowl

surveys. This information would be compared to data from years with the Cargill hunt program and the recent years without hunting to determine if the implemented program is providing quality hunting opportunities for the public, causing conflict with other users and/or impacting bird populations or habitat. Adjustments to the hunt program would be made to correct unanticipated negative impacts.

Chapter III: AFFECTED ENVIRONMENT

The Don Edwards San Francisco Bay National Wildlife Refuge is located in Alameda, Santa Clara and San Mateo Counties at the South end of San Francisco Bay. It's approximately 28,000 acres are a mixture of salt marsh, salt ponds, mudflat, seasonal wetlands and upland. The approximately 5,500 acres of ponds covered in this Environmental Assessment are former commercially operated salt ponds surrounded by upland levees that were operated and maintained by Cargill Salt Division. Thin strips of tidal marsh occur along the outside base of the levees and in the slough channels between some of the levees (Permanente Creek, Stevens Creek, Guadalupe Slough, and Alviso Slough). Areas outside the levees (salt marshes) are generally not part of the purchased lands and are not subject to this Hunt Plan Amendment.

Urban Context of the Salt Ponds

The salt ponds are in a highly urbanized area with a population of approximately 3.5 million residents immediately surrounding the south bay ponds. An additional 4 million residents in the Bay Area are located in nearby areas and counties and many of these residents likely view some of the salt ponds during their daily commutes to and from work.

Ponds A1 and A2W are completely visible from the Bay Trail in the Shoreline Park at Mountain View Park. Pond A1 is also visible from the Palo Alto Charleston Slough Trail and Pond A2W can be seen from the Stevens Creek Trail (Figure 2). Service vehicle access to Pond A1 is along the Bay Trail and Charleston Slough in the Park. Access to Pond A2W is from the Stevens Creek Trail (Figure 2). Under Cargill ownership, hunters holding leases drove these public use trails to access the ponds. These trails are closed to all other motorized vehicle use by the public. The Bay Trail and Charleston Slough Trail are very popular with outdoor recreationists including walkers, hikers, bicyclist, joggers, nature photographers and birdwatchers. These trails are used by hundreds of visitors each day with heaviest visitation on good weather and weekend days. It is estimated that these trails receive 300,000 visitor days per year for an average of 600 per day (personal communication, staff of Shoreline Park at Mountain View). The Stevens Creek Trail is used by the same types of visitors but at a lower rate. Past hunting of waterfowl on these two ponds has been very controversial because some members of the public strongly objected to hunting in general and/or hunting in an area which is visible from a high use public area (personal communication, City of Mountain View staff and elected officials).

Ponds AB1, A2E, AB2, A3N, and A3W are located on the Bay side of the NASA/Ames facilities at Moffett Field. These government facilities are quite large and have many

employees and visitors. Despite the proximity to these facilities, the area immediately adjacent to the salt ponds is open space and receives little public use. However, there is a strong local desire to extend the Bay Trail along the salt pond levees adjacent to Moffett in the near future. Ponds AB1 and A2E are bordered on one side by the Stevens Creek Trail (Figure 3). Pond A3W is visible from a short section of the Sunnyvale Treatment Plant public trail system (Figure 3). The Sunnyvale trail system has similar user groups as the Bay Trail and Charleston Slough Trail but receives fewer visits than those trails. Vehicle access to these ponds is along the Stevens Creek trail on the north from Crittenden Lane (Figure 4) and through the Sunnyvale Treatment Plant pond and recreational trail on the south from Carl Road (Figure 5). Like the access to Ponds A1 and A2W, under Cargill ownership, hunters holding leases or subleases drove on the public use trails to access these ponds but the trails were closed to motorized vehicle use by the general public. Hunting of these ponds has been less controversial but hunter vehicle access through the treatment plant and trail system has not been popular (personal communication, City of Mountain View staff and City of Sunnyvale staff).

Ponds A5, A7 and A8N are, for the most part, not visible from public recreational trails. A portion of Pond A5 is visible from a short portion of one of the lesser used trails on the Sunnyvale Trail System. These ponds are accessible from Gold Street in Alviso through an easement on undeveloped property owned by Legacy, Inc. (Figure 6). Though hunting on the Refuge in general is controversial, the Refuge is not aware of public controversy specifically related to hunting of these particular ponds.

Pond A22 is bordered on one side by a computer company business development (Lam Research). It is also visible from the Refuge's Warm Springs trail off Cushing Parkway in Fremont (Figure 3). This trail is used primarily by workers in the business development on work week days. Pond A23 is not visible by the public except passing trains using the Union Pacific tracks (Amtrak and Altamont Commuter Express trains). These ponds were not hunted in the past because waterfowl habitat was limited due to high salinity and low water levels.

Pond SF2 is immediately adjacent to Highway 84, the congested highway approach to the Dumbarton Bridge that is the southern most bridge crossing in the San Francisco Bay. A portion of Pond R3 is adjacent to a computer company business development (Sun Micro Systems) and Bayfront Expressway, a congested feeder road between Highway 84 and Highway 101 (Figure 3). Ponds R4, R5, RS5 are adjacent to the Bayfront Expressway and visible from the Menlo Park Bayfront Park. Bayfront Park is used by walkers, joggers, and bicyclist and to a lesser extent, birdwatchers and photographers. It is less developed and receives less use than the recreational areas adjacent to the ponds in Palo Alto, Mountain View and Sunnyvale. These Ravenswood ponds have not been hunted in the past.

Anticipated Management of the Ponds During the Initial Stewardship Period

Under the Initial Stewardship Plan (ISP) (FWS 2004), the Refuge is changing the operation of the ponds from Cargill's past management. The ISP is covered in more

detail in the ISP Environmental Impact Statement/Report at <www.southbayrestoration.org>. The ISP salinity reduction operations will continue during the development and implementation of the South Bay Salt Pond Restoration Plan (Plan), a long-term restoration plan for the salt ponds. Operations under the ISP are anticipated to last for 5 to 50 years, depending on the pond. Implementation of the Plan is expected to begin in 2008 and will continue in phases for 20 to 50 years. Once the Plan is completed, selected ponds will be converted to tidal marsh and all public use including waterfowl hunting would be reconsidered in the plan development. Under the ISP, decisions on hunting were deferred until the Hunt Plan Amendment could be developed. No hunting has been allowed during the development of the Amendment.

Under Cargill management, public access to these commercial salt ponds was limited to the following: the Stevens Creek trail (Figure 4) was open to the public along the west side levees of Ponds AB1 and A2E and specific ponds were open to waterfowl hunting by leaseholders and sublease holders only. Under the Refuge's ISP, the Stevens Creek Trail along the west side of Ponds A2E and AB1 will remain open and docent-led tours will be given throughout the year. At the present time, these tours are done off the Refuge at a location overlooking the Ravenswood Ponds however it is possible at some time in the future that the tours could be expanded to ISP ponds themselves. Outside of access along the Stevens Creek Trail and the docent-led tours, the ISP ponds are closed to the public. As the Plan is developed, conversion of selected ponds to tidal marsh and increasing public use would be considered. All public use including hunting would be reconsidered at this time. When the Refuge's Comprehensive Conservation Plan is completed, the Hunt Plan could also be amended.

Under commercial salt production, the Alviso Ponds had a 6-year average depth in the winter between 0.6 feet and 3.7 feet (Table 1). The Ravenswood Ponds had a 6-year average depth in the winter between 0.7 feet and 1.7 feet. The salinity range for the Alviso Ponds was between 11 parts per thousand (ppt) and 110 ppt. The Ravenswood Ponds had a salinity range between 35 ppt and 340 ppt (Table 1). The ponds nearest the intake structures (i.e., the water control structures that allowed water to enter the pond system from the Bay) had the lowest salinity (A1 ranged from 11 ppt to 42 ppt) while the ponds furthest from the intake structures had the highest salinity (A8N ranged from 31 ppt to 110 ppt). Ponds A22 and 23 were frequently dry and therefore, pond depth and salinity were not always recorded. The Ravenswood Ponds were far from a major intake and close to a plant site, and the resulting salinities were on average much higher than the Alviso Ponds.

Under the ISP, instead of Ponds A1 through A8N (Figure 1) being a continuous, connected line of ponds with Bay water entering A1 and continuing through A8N and beyond, the ponds will be broken into smaller units. Ponds A3N and A8N will be seasonal ponds with water depth dependent on rainfall. Ponds A1 and A2W will continue to be connected to each other but will be separated from the rest of the system with the intake in A1 and outlet to the Bay in A2W. These ponds will be managed with salinities similar to Bay waters as was the case under Cargill's management. They should continue to have high numbers of waterfowl.

Ponds AB1, A2E, AB2 and A3W (Figure 1) will continue to be connected to each other but will be separated from the rest of the system. There will be an intake from the Bay at Pond AB1 with an outlet to Guadalupe Slough at Pond A3W. These ponds will be operated at lower salinities than under Cargill's management. Because they will have lower salinities similar to the historic operation of Ponds A1 and A2W which historically received much higher use by waterfowl, Ponds AB1, A2E, AB2 and A3W are predicted to support higher numbers of waterfowl than under Cargill's management.

Ponds A5 and A7 will continue to be connected to each other but will be separated from the rest of the system. There will be an intake of water from Guadalupe Slough at A5 with an outlet to Alviso Slough at A7. Because they will have lower salinities, they are expected to receive more use by waterfowl and perhaps other birds than under Cargill's management.

Mowry Unit Ponds A22 and A23 will continue to be operated by Cargill for approximately six years while the extremely high salinities are lowered. Ravenswood (West Bay) Unit Ponds SF-2, R3, R4, R5 and RS5 will also continue to be operated by Cargill for up to 5 years while they lower the salinity of the ponds. Salinity levels will continue to decrease throughout this 5 year period.

In the ISP period, Cargill is obligated to operate and maintain the ISP ponds until the salinity of the ponds is lowered to meet the Regional Water Control Board's discharge standards (44 ppt) after which management responsibility is turned over to the Refuge (Phase Out Agreement 2003). Management of Ponds A1 – A17 (Figure 1) were turned over to the Refuge in 2004. Ponds A19-21 (Figure 1) are expected to be turned over to the Refuge in 2005 or 2006. Under the ISP, these three ponds will be restored to tidal action but hunting will continue to be prohibited per this Amendment. Management of Ponds A22-23, SF2, R3-S5 will be turned over to the Refuge in approximately 7 years at which time the long-term restoration plan will be complete.

Previous Hunt Opportunities on the Acquired Lands

The following Alviso Ponds had been hunted for decades under Cargill's ownership: A1, A2W, AB1, A2E, AB2, A3N, A3W, A5, A7, and A8. Ponds A22, A23, and the Ravenswood Ponds were not open to hunting under Cargill ownership Trail (Figure2).

Cargill's hunt program was operated through a system of private leases and subleases. Cargill leased each pond to an individual and that leaseholder generally subleased their pond to other hunters. The leaseholder was responsible for managing the hunt on his pond by controlling access, maintaining blinds, docks for boats, and assuring the earthen levee roads were not damaged by hunters trying to drive on them following rains. Hunters maintained duck blinds within the ponds and accessed the blinds by boat. When the pond depth was deep enough, boats with small motors were used to travel to the blinds. When the ponds were shallow, boats were rowed or even walked to the blinds. The boats were stored at the edges of the ponds at simple wooden docks. The docks were

accessed via the salt pond earthen levees by motorized vehicles when the levees were dry enough to drive. Each sublease holder was given the combination to the Cargill locked gates which allowed the hunters to enter the levee road system while keeping all other members of the public out of these private ponds. Most ponds were open to hunting 7 days a week, though a few ponds were open only a few days a week.

In 2002-2003 hunt season, 175 leaseholders and sublease holders used the 3,328 acres of salt ponds under the Cargill hunt program (personal communication. Chuck Taylor, Cargill). Some ponds had as many as 30 hunters while others had as few as 5 hunters, with an average of 17.5 hunters per pond. Though no formal surveys were taken, Cargill staff estimate their ponds supported approximately 1,000 hunter days each year.

Existing Hunting on Refuge Lands

Under the existing Hunt Plan, approximately 7,663 acres (25%) of the Refuge (4,380 acres of commercial salt ponds similar to those being considered in this assessment) are currently available for waterfowl hunting (Figure 1) and 22,337 acres (75%) serve as sanctuary. If hunting is allowed on the area that is the subject of this environmental assessment it would be in addition to this existing area open to hunting.

Hunting pressure on existing refuge lands open to hunting has been estimated by refuge staff to include approximately 600 hunter days annually in the Ravenswood Unit (Ponds R1 & R2, Ravenswood Slough and tidal marshes outboard of the levees). This unit has both boat and walk in access. Refuge staff also estimate approximately 1,400 hunter days are annually experienced in the Mowry Slough Unit (Ponds M1, M2, M3, M4, M5, M6 and A19, and the adjacent tidal marshes and sloughs) (Figure 1) all of which are only accessible by boat. The vast majority of this hunting is done in the tidal sloughs and marshes rather than the Mowry Salt Ponds.

Hunters using boats to hunt the Refuge have had a limited number of access points for launching their boats. A boat ramp at Redwood City serves Bair Island, Greco Island and Ravenswood Slough, and is sometimes used by those hunting the east side of the Bay (both on and off Refuge lands) and other areas further south (both on and off Refuge lands), but this can be difficult when the weather is rough. Hunters use the Newark Slough boat ramp to access ponds and marshes on the east side of the Bay and some areas closer to the south end of the Bay. This boat ramp is only usable at high tides. Some hunters have used an informal ramp to Coyote Creek off Dixon Landing Road to access areas south of the Union Pacific Railroad Bridge at Drawbridge. However, recent road construction work has made this informal access point difficult to use. A few hunters have access to launch sites on private land or the South Bay Yacht Club docks into Alviso Slough, which provides the best access point for the adjacent sloughs and marshes. Santa Clara County has recently received funding and clearances to build a boat ramp on Alviso Slough. This ramp is expected to be built within 1 to 2 years: 2005-2006 (personal communication, Dangkhoa Vo, Santa Clara County).

Biological Resources

The San Francisco Bay including the Don Edwards San Francisco Bay NWR in the South Bay is a major wintering area for Pacific Flyway waterfowl. Significant numbers of the Pacific Flyway scaup (70%), scoter (60%), canvasback (42%), and bufflehead (38%) are located in the San Francisco Bay/Delta. According to 1998 California Fish and Wildlife surveys, San Francisco Bay held the majority of California's 1999 wintering scaup (85%), scoter (89%), and canvasback (70%) populations. More than 56 percent of the State's 1999 wintering diving ducks were located in the San Francisco Bay proper, which includes the salt ponds and wetlands adjacent to the North and South Bays. Although the San Francisco Bay is most recognized for its importance to diving ducks, large numbers of dabbling ducks like pintail (23,500) and wigeon (14,000) were observed during the 1999 mid-winter waterfowl survey. (Restoring the Estuary, Implementation Strategy of the San Francisco Bay Joint Venture, 2001)

Biologists conducting annual mid-winter waterfowl surveys for San Francisco Bay have counted an average of 190,000 waterfowl per year (range: 89,638 to 347,889 between 1989 -2003). In the past 5 years, approximately half of the Bay Area ducks and geese were found in the South Bay (average 98,000 per year), and fifty-seven percent of the South Bay waterfowl were using the salt ponds versus the open bay (See Table 2, Appendix A). These mid-winter surveys were conducted while many of the ponds were open to hunting under Cargill's hunting program or the Refuge's existing hunt program. This data is based on annual aerial surveys conducted during the first week of January for the past several decades.

Cargill managed these Alviso ponds with a major water intake structure at Pond A1 and smaller supplemental intake structures at Ponds AB1 and A9. The ponds nearest the intake structures had the lowest salinities and the highest densities of waterfowl: A1, A2W, A9 and A10 (Table 3). Approximately 12 species of waterfowl were identified in the subject ponds during the mid-winter surveys with the most common species being American widgeon, pintail, northern shoveler, canvasback, ruddy duck and scaup. Coots were common or absent depending on the pond and year. Geese were not common on the ponds but are common to abundant in other habitats near the Refuge such as parks, golf courses and agricultural fields. The ponds are also used by other species of birds at various times throughout the year including American white pelican, double crested cormorant, California gulls, eared grebes, and a variety of shorebirds such as American avocet, black-necked stilt, willet, and at high tides, western and least sandpipers.

Waterfowl abundances are higher in the lower salinity ponds near the intake structures compared to the higher salinity ponds that are further from the intake structures. For example, in the non-hunted Pond A9 to A17 system, the two ponds closest to a supplementary pond intake (A9 and A10) had 96% of the waterfowl in that system on surveys from 2000-2003, even though these two ponds comprised only 26% of the pond area in Ponds A9 to A17 (Table 3). This tendency held true for the ponds hunted under Cargill management: the two ponds closest to the major Bay water intake (Ponds A1 and A2W) had 46% of the ducks in the A1 to A8 pond system even though they had only 21% of the pond acreage of that pond system.

Under the Initial Stewardship Plan, more ponds would have Bay water intakes and therefore, lower salinities. It is expected that these ponds would become favored by wintering waterfowl and certain species of other water birds (except species that prefer higher salinity ponds such as eared grebes and phalaropes).

The following federally listed species are known to use salt pond habitat or adjacent salt marsh habitat in the South San Francisco Bay:

Endangered Species:

California brown pelican (*Pelecanus occidentalis*): There are no roost sites or feeding areas for brown pelicans in the South Bay. Brown pelicans breed on the Channel Islands and south into Mexico. During the summer and fall there is a post-breeding dispersal up the Pacific Coast (Anderson and Gress 1983). Brown pelicans begin arriving in northern California in April or May, and numbers are highest in July through September following their breeding season. Pelicans roost in several sites in north and central San Francisco Bay, and on the Farallon Islands. They feed on small surface-schooling fish, primarily anchovy, in the Bay and coastal waters. Pelican numbers begin dropping in November, and the majority have retreated south by the end of December (Jaques-Strong 1994).

Brown pelicans are occasionally observed in South Bay salt ponds but they do not use salt ponds for any particular life history component, nor have they been documented to favor certain ponds over others. Brown pelicans have not been observed in salt ponds during the mid-winter waterfowl surveys that are conducted in early January or late December (Joelle Buffa, personal communication). United States Geological Survey (USGS) conducted waterfowl surveys of the newly acquired salt ponds during 2002 and 2003 (USGS Unpublished Data 2002-2203). The following table lists the USGS brown pelican observations during hunting season (late October through January) on selected salt ponds being considered in this Environmental Assessment.

Table 1. Brown Pelican Observations on Ponds Proposed to be Open to Hunting under the Amendment

	AB1	A2E	AB2	A3N	A3W	A5	A7	A8N
2002	0	0	0	4 in Dec	1 in Oct 2 in Nov 5 in Dec	2 in Nov	0	0
2003	0	1 in Jan	1 in Jan	0	1 in Jan	0	0	0

Although sparse, these data demonstrate the intermittent manner in which brown pelicans use the salt ponds. While ponds A3N and A3W had a combined total of 12 observations in 2002, only 1 brown pelican was seen on these ponds in 2003. Additionally, during the 2002 observation period, the ponds were still open to hunting under Cargill's hunt program. Although brown pelicans were observed on the ponds during hunt season that

year, there are no reported cases of take of brown pelicans under Cargill's hunt program nor in the areas of the Refuge that are currently open to waterfowl hunting.

California clapper rail (*Rallus longirostris obsoletus*): The California clapper rail resides year round in tidally inundated pickleweed-dominated salt marsh habitat. The California clapper rail is generally found in the low- to mid- elevations of the marsh, and spends most of the time hiding within the vegetation (Spartina spp. and Grindelia spp.). Clapper rails are most sensitive to disturbance during their breeding season which is February 1 through August 31st. No suitable salt marsh habitat is found within the salt ponds that are the subject of this alternative. Thin (< 5 feet wide) strips of salt marsh vegetation are found along the base of certain salt pond levees on the Refuge. Wider areas of salt marsh vegetation exist along the exterior side of levees that border the section of the following slough channels (Permanente Creek, Stevens Creek, Guadalupe Slough, and Alviso Slough) near the Bay. The further upstream the sloughs from the Bay, the less habitat is suitable for California clapper rails (Ponds A5, 7 and 8N).

California least tern (*Sterna antillarum browni*):
The California least tern does not currently breed on the Refuge. Individuals breeding at Alameda Point feed on open water areas of the Bay. The terns use the salt ponds on the Refuge during late summer and early fall prior to migration from their nesting grounds. The hunting season typically opens in mid-October and ends in late-January. Terns are not present during the hunting season.

Salt marsh harvest mouse (*Reithrodontomys reviventris reventris*): The salt marsh harvest mouse is a year round, breeding resident of tidally inundated, pickleweed-dominated salt marsh habitat on the Refuge. Salt marsh harvest mice can survive in pickleweed-dominated areas at all elevations, including the margins, of the marsh. No suitable salt marsh habitat is found within the salt ponds that are the subject of this Environmental Assessment. However, the thin (< 5 feet wide) strips of salt marsh vegetation that line the base of certain salt pond levees are considered suitable habitat for the salt marsh harvest mouse. Wider areas of salt marsh vegetation exist along the exterior side of levees that border the section of the following slough channels (Permanente Creek, Stevens Creek, Guadalupe Slough, and Alviso Slough) near the Bay. The further upstream the sloughs from the Bay, the less habitat is suitable for California clapper rails and salt marsh harvest mouse.

<u>Threatened species:</u>
Western snowy plover (*Charadrius alexandrinus nivosus*): Western snowy plovers nest and winter on salt ponds which are dry or have limited water confined to the dredge channels along the inside edges of the levees. Ponds A22, A23, SF-2, R3 and R4 are the only ponds that have had nesting and wintering plovers at least one year out of the past five years. Ducks do not normally use these dry ponds.

Ponds A8N and A3N are operated as seasonal ponds and fill with rain water. Under normal rainfall years, these ponds fill with sufficient water so as to not be considered suitable habitat for snowy plovers.

Chapter IV: ENVIRONMENTAL CONSEQUENCES

The environmental and social effects of implementing each alternative are summarized in the following table and are discussed in the following text. For a full discussion of the effects of hunting on Flyway populations of waterfowl, the reader should refer to the Final Supplemental Environmental Impact Statement on Issuance of Annual Regulations Permitting The Sport Hunting of Migratory Birds, U.S. Fish and Wildlife Service, 1988.

<u>Alternative 1:</u> No Waterfowl Hunting on Salt Ponds (No Action).

Under this alternative, all the newly acquired salt ponds waterfowl hunting would continue to be closed. Waterfowl hunting would continue to be open on other sections of the Refuge as it was before the new ponds were purchased. There would be no effect on Refuge or Pacific Flyway waterfowl populations or other wildlife on the Refuge. There would be no potential for conflict between hunters and other Refuge users over these ponds. This would not allow the Refuge to provide additional waterfowl hunting opportunities to the public in the South San Francisco Bay.

A. Impacts on waterfowl population.

Since this alternative does not change the current conditions, there would be no positive or negative impact on the Pacific Flyway waterfowl populations. There might be a positive impact on Refuge waterfowl compared to Alternative 2 & 3 because individual ducks would not be shot on these ponds and more sanctuary would be available to (Table 5) so birds might shift use from other Refuge or non-refuge areas. There would be fewer negative impacts to waterfowl under this alternative than that which occurred under Cargill's hunt program on these ponds because the hunting that occurred under Cargill ownership would not occur. There would be fewer negative impacts to Refuge waterfowl than under Alternatives 2 and 3 that allow waterfowl hunting.

B. Impacts on social values.

There would be no potential for conflict between hunters and adjacent property owners and other Refuge users over these ponds. This would not allow the Refuge to provide additional waterfowl hunting opportunities to the public in South San Francisco Bay. Since hunting would be allowed under Alternatives 2 and 3, there would be more potential for conflict between hunters and adjacent property owners and other Refuge users under Alternatives 2 & 3 as compared to no conflicts under Alternative 1. This alternative would likely be opposed by the California Department of Fish and Game, sportsmen's organizations and individuals interested in expanding hunting opportunities on National Wildlife Refuges and in San Francisco Bay. It would be favored by anti-hunting organizations and individuals.

C. Impacts on wildlife other than waterfowl.

There would be no positive or negative impact on other wildlife under this alternative because it would not change the current no hunting condition. There might be a positive impact on Refuge wildlife other than waterfowl compared to Alternative 2 & 3 because more sanctuary would be available (Table 5) so birds might shift use from other Refuge or non-refuge areas. There would be fewer negative impacts (disturbance causing birds to use energy to move other nearby habitats) to wildlife other than waterfowl under this alternative than that which occurred under Cargill's hunt program on these ponds because the hunting that occurred under Cargill ownership would not occur. There would be fewer negative impacts to Refuge wildlife other than waterfowl than under Alternatives 2 and 3 that allow waterfowl hunting.

Under this alternative, the subject ponds would be monitored by Refuge law enforcement staff to assure no hunting is taking place. The Refuge would continue to conduct snowy plover surveys, inventory bird populations through USGS pond surveys and the mid-winter waterfowl surveys.

Alternative 2: Waterfowl Hunting Confined to Certain Ponds (Proposed Action).

Under this alternative, a selected number of ponds would be open to waterfowl hunting. Hunting would be allowed for three days each week following regulations, season and bag limits set by the California Department of Fish and Game, (See Chapter II for complete explanation of hunt program for this alternative). This would result in more area open for hunting than the No Action Alternative (Alternative 1) and less area than the Waterfowl Hunting on All Ponds Alternative (Alternative 3).

A. Impacts on waterfowl population.

Under this alternative, a small, temporary decline in the Refuge waterfowl population could occur because of the direct loss of individual birds shot by hunters as compared to Alternative 1 which has no hunting. Mid-winter waterfowl surveys have been conducted during the hunt season of the ponds that were open to hunting under Cargill seven days a week and those that were closed to hunting (Table 3). From 2000 to 2003, the hunted ponds averaged 3.5 waterfowl/acre compared to 4.3 waterfowl/acre for ponds that were not open to hunting. Since the proposed hunt program will limit hunters to the same number of blinds that were in existence under the Cargill hunt program it is estimated that the density of hunting will be similar. Therefore, it is estimated that substantial waterfowl will continue to use the ponds even though they are open to hunting and perhaps more will use the ponds since they will only be open to hunting 3 days a week.

There would be no measurable effect on Flyway waterfowl populations. Because annual Pacific Flyway harvest regulations are designed to ensure that viable populations of

waterfowl are sustained over the long term, this alternative would not have any measurable impact on viable populations of waterfowl species as long as regulations are enforced on the Refuge. Wildlife populations would continue to be monitored under this alternative.

B. Impacts on social values.

Under this alternative, there would b more conflict with the non-hunting public than Alternative 1 because hunting would be allowed on some of the ponds that are visible by the public. There would be less conflict than Alternative 3 because fewer ponds would be open to hunting including those ponds that are visible from high public use areas such as the Mountain View Bay Trail.

Waterfowl hunting would not be allowed in the areas with the greatest visibility by the non-hunting public. Ponds A1 and A2W were hunted under Cargill ownership. These ponds are visible from the Shoreline at Mountain View Park's Bay Trail and the Charleston Slough Trail (Figure 3). These trails receive approximately 300,000 visitors per year. There were numerous conflicts and complaints by the non-hunting public about hunting in these two ponds. In February, 2004, the Mountain View City Council took the position that "…hunting should be prohibited in Ponds A1 and A2W". They stated: "While hunting may be a safe and appropriate recreational use for ponds elsewhere in the Alviso Pond Complex, hunting in Ponds A1 and A2W could pose a public use conflict and raise public safety concerns with the many trail users at Shoreline at Mountain View because these ponds are immediately adjacent to and completely visible from Shoreline at Mountain View." (February 26, 2004 Letter from City of Mountain View commenting on the Draft South Bay Salt Pond Initial Stewardship Project EIR/EIS) By eliminating hunting on these two ponds, there would be substantially less user conflict when compared to Cargill's hunt program.

Ponds AB1, A2E, AB2, A3N, and A3W are located on the Bay side of the NASA/Ames facilities at Moffett Field (Figure 3). The area immediately adjacent to the salt ponds receives little public use. Ponds AB1 and A2E are bordered on one side by the Stevens Creek Trail. Pond A3W is visible from a short section of the Sunnyvale Treatment Plant public trail system. The Sunnyvale trail system has similar user groups to the Bay Trail and Charleston Slough Trail but receives fewer visitations than those trails (Figure 3). Government vehicle access to these ponds is along the Stevens Creek trail on the north and through the Sunnyvale Treatment Plant pond and recreational trail on the south. These trails are not open to private vehicles. Like the access to Ponds A1 and A2W, under Cargill ownership, hunters holding leases or subleases drove on the public use trails to access these ponds but the trails were closed to motorized vehicle use by the general public (Figure 4). Hunting of these ponds has been less controversial, though hunter vehicle access through the treatment plant and trail (Personal Communication, City of Mountain View staff and City of Sunnyvale staff).

Under the Cargill hunt program, hunters holding private leases accessed Ponds A5, 7, and 8N from Gold Street in Alviso (Figure 6) which is not an area near other public recreation

users. No reports were received by Cargill about conflict with the public over hunter access to this area (Personal Communication, Chuck Taylor, Cargill). Because Ponds A5, 7 and 8N are accessed only by foot over levees that are not open to the pubic and this area continues be more hidden than the entrances to the other ponds, no conflict is expected over hunter access to these ponds.

Hunters' vehicle access to Pond A3W would cross about 200 yards of levee trail in Sunnyvale that is open to the public before it enters the closed portion of Cargill's property along the A3W/A4 channel (Figure 5). Trail users might object to private parties driving on the trail. However, it is likely that the non-hunting public would have an even stronger adverse reaction to seeing hunters with their firearms, dogs and ducks walking on the public trail. Therefore, to reduce this conflict as much as possible and because the distance from the trail to Pond A3W is over one mile, it was decided that requiring vehicle access was the best alternative. It also allows disabled hunter access to these ponds that might not be possible if hunters were not allowed to drive to the boats on the ponds.

Hunters' vehicle access to Ponds A2E and AB1 would cross the pedestrian and authorized vehicle bridge over Stevens Creek and along one half mile of the Stevens Creek Trail (Figure 4). Like the access route to Pond A3W in Sunnyvale, it is likely that the non-hunting public would have a stronger adverse reaction to seeing hunters walking along the trail with their shotguns, dogs and ducks than seeing the hunters driving along the trail.

These ponds were open to hunting seven days a week under Cargill ownership. Under this alternative, these ponds would be open to hunting three days a week. This would further reduce what is anticipated to be a minor conflict with the non-hunting public and adjacent landowners however; it would still cause more conflict that Alternative 1 which does not allow hunting. Because the ponds would be closed to hunting four days a week, waterfowl would use the ponds as a sanctuary four days a week which should result in greater numbers of huntable birds on the open ponds for hunt days and a better quality hunt.

Pond A22 is bordered on one side by a computer company business development (Lam Research). It is also visible from the Refuge's Warm Springs trail with its trailhead off Cushing Parkway in South Fremont is used mostly by workers in the business development on work week days (Figure 3). Pond A23 is not visible by the public except passing trains using the Union Pacific tracks (Amtrak and Altamont Commuter Express trains). Under this alternative, these ponds would not be open to hunting and therefore, there would not be a conflict with the non-hunting public.

Pond SF-2 is immediately adjacent to Highway 84, the congested highway approach to the Dumbarton Bridge that is the southern most bridge crossing in San Francisco Bay (Figure 3). A portion of Pond R3 is adjacent to a computer company business development (Sun Micro Systems) and Bayfront Expressway, a congested feeder road between Highway 84 and Highway 101. Ponds R4, R5, RS5 are adjacent to the Bayfront

Expressway and visible from the Menlo Park Bayfront Park. Bayfront Park is used by walkers, joggers, and bicyclist and to a lesser extent, birdwatchers and photographers. It is less developed and receives less use than the recreational areas adjacent to the ponds in Palo Alto, Mountain View and Sunnyvale. These ponds have not been hunted in the past and would not be open to hunting under this alternative. Therefore, there would not be a conflict with the non-hunting public over hunting these ponds.

The Refuge provides docent-led tours of the ponds on scheduled days. Currently, these tours are held about 4 times a month and are conducted off the Refuge at a view area over the Ravenswood Ponds. Since no hunting is proposed for these ponds, this alternative would not impact these tours. There is a potential that in the future some tours would expand to ponds that are being proposed to be hunted under this alternative. Since over 2,000 acres of the recently purchased salt ponds would not be open to hunting and hunting is restricted to 3 days a week, the salt pond tours would have adequate locations and time to continue during the hunt season if the tours were expanded in the future. The hunting blinds on Ponds A2E and AB1would be located a safe distance from the Stevens Creek Trail.

Under this alternative, the Refuge would provide additional waterfowl hunting opportunities to the public in South San Francisco Bay. There would be fewer ponds open to hunting than was available under the Cargill hunting program but these ponds would be open to all licensed hunters rather than just leaseholders. There would be more hunting opportunity than what is offered under Alternative 1, the No Action Alternative. There would be less hunting opportunity under this alternative than under Alternative 3.

This alternative would likely be supported by the California Department of Fish and Game and some sportsmen's organizations and individuals interested in expanding hunting opportunities on National Wildlife Refuges and in San Francisco Bay. It would probably be supported by the Cities of Mountain View and Sunnyvale because it does not allow hunters to access the ponds using their private vehicles on public trails that were the practice under Cargill ownership. The City of Mountain View would support closing Ponds A1 and A2W, which they requested. The plan might not be supported by some of the hunters who held private leases under Cargill's ownership. It would not be favored by anti-hunting organizations and individuals who object to all hunting on the Refuge.

In summary, there would be less conflict with adjacent landowners and the non-hunting public under this alternative than existed under the Cargill hunt program because the two most controversial ponds that were open to hunting under Cargill ownership would not be open and hunting would be restricted to three days a week rather than Cargill's seven days a week hunt program. Because the ponds would be closed to hunting four days a week, waterfowl would use the ponds as a sanctuary four days a week which should result in greater numbers of huntable birds on the open ponds for hunt days and a better quality hunt.

However, there would be more conflict than under Alternative 1 in which there would be no waterfowl hunting in any of the subject salt ponds. There would be fewer ponds open

but they would be open to more hunters than under Cargill ownership. There would be more hunting opportunity than under Alternative 1. There would be less conflict with non-hunters than under Alternative 3 and would offer less hunting opportunity than Alternative 3. Because the ponds would be closed to hunting four days a week compared to Alternative 3 which would have all ponds open seven days a week, in this alternative, waterfowl would use the ponds as a sanctuary four days a week which should result in greater numbers of huntable birds on the open ponds for hunt days and a better quality hunt. Because this alternative provides for waterfowl hunting, it is likely to be opposed by anti-hunting organizations.

C. Impacts on wildlife other than waterfowl

An informal Section 7 of the Endangered Species Act consultation is being conducted on this proposed amendment of the Refuge Hunt Plan. The consultation would be included in the final Environmental Assessment.

There are three Federally listed endangered or threatened species known to use the affected salt ponds.

California Least Tern

The terns are not present during the hunting season that typically opens in mid October and ends in late January and therefore would not be impacted by any of the alternatives.

Western Snowy Plover

Western snowy plovers nest and winter on ponds which are mostly dry. Ponds A22, A23, SF-2, R3 and R4 have had nesting and wintering plovers at least one year out of the past five years. The Western snowy plovers generally would only be present on ponds that would be dry or with very limited water in the dredge channel along the inside edges of the levees. Ducks do not normally use dry ponds and therefore would not be subject to hunting pressure. None of the ponds that are going to be open to hunting under this alternative have been used by plovers in the hunting season for the past five years. The ponds that have been used for nesting and wintering habitat are not being proposed for waterfowl hunting in this alternative.

Ponds A8N and A3N are operated as seasonal ponds. They fill will rain water. Under normal rainfall years, these ponds will have so much water that they will not be used by snowy plovers. However, if an extremely dry year is encountered such that these two ponds are dry enough to become suitable plover habitat, they will be closed to hunting. No impact on snowy plovers is expected under this alternative as none is expected under Alternative 1.

Brown Pelican

There are no roost sites for brown pelicans in the South Bay and they rarely use the subject ponds (See Chapter 3, Affected Environment). They are more common in tidal areas north of the Dumbarton Bridge. If pelicans are in the area during hunting days, there is ample comparable habitat nearby for them to use as a sanctuary including nearby tidal marsh and open bay as well as adjacent salt ponds that would not be open to hunting. There are no reported cases of take of brown pelicans in the areas of the Refuge that are currently open to waterfowl hunting and no reports of impact to brown pelicans in these ponds under Cargill's hunt program. Because of the pelican's obvious differences in size and shape, hunters are unlikely to confuse pelicans with legally hunted waterfowl. No impact on the brown pelican is expected under this alternative.

No adverse impacts to brown pelicans are expected under this Hunt Plan Amendment. Hunting season does not coincide with peaks of seasonal pelican distribution in northern California. The majority of pelicans move south to breeding areas by November and December. The closest Bay Area roost to the subject ponds is Breakwater Island in Alameda, over 20 miles north of the Dumbarton Bridge. Although the USGS data shows that some lingering brown pelicans from this roost may still be present during hunting season, there is ample comparable habitat in the South Bay for them to use, including tidal marsh, open bay, and adjacent non-disturbed ponds. Additionally, pelicans spend the night on their roosts and most hunting occurs in the early morning hours, which makes the chances of a pelican being in the vicinity of hunting activity even more unlikely. Therefore, the chance of a pelican landing in a pond during the period of time actually occupied by hunters is very small. The proposed hunting may affect individual pelicans if on the rare occasion they are on the ponds during hunting periods and this results in their moving to another section of the pond or another location in the Bay, but the brown pelican is not likely to be adversely effected.

Although no adverse impacts to brown pelicans are expected under this alternative, the slight chance that a brown pelican would be present or fly over one of the salt ponds proposed to be open to hunting does exist. In order to reduce to inconsequential any disturbance to brown pelican, and eliminate the potential for take on ponds open to hunting, law enforcement activity would be heightened during the waterfowl season. Additionally, the UGSG surveys of the ponds will continue as part of the monitoring program for the ISP. These data will be assessed annually by the Refuge Manager. If brown pelican observations increase substantially on any of the ponds, the potential for disturbance will be re-evaluated and the hunting program modified to eliminate any negative impacts. USGS monitors will be put on "heightened awareness" during the hunting season and instructed to report any brown pelican disturbance to the Refuge Manager.

California Clapper Rail and Salt Marsh Harvest Mouse

Since the hunting season does not overlap with clapper rail breeding season, no impacts to breeding rails are anticipated. Non-breeding rails will not be impacted either because no suitable salt marsh habitat is found within the salt ponds that are the subject of this alternative. Thin (< 5 feet wide) strips of salt marsh vegetation are found along the base

of certain salt pond levees on the Refuge. Wider areas of salt marsh vegetation exist along the exterior side of levees that border the section of the following slough channels (Permanente Creek, Stevens Creek, Guadalupe Slough, and Alviso Slough) near the Bay. In order to avoid potential trampling of marsh habitat or disturbance by hunters or their dogs, hunters would not be allowed to hunt on foot along the levees of ponds that are bordered with salt marsh vegetation. The pond levees that have suitable salt marsh vegetation along their edges (AB1, AB2, and A3N) will be closed to walking hunters. Hunters would only be allowed to hunt from existing blinds on the interior of these ponds which would only be accessed via boats that are moored at designated places within the pond. As with Alternative 1, this alternative would have no impact on the rail or the mouse.

Wildlife Other Than Threatened, Endangered Species and Waterfowl

This alternative would have the potential for a negative impact (some birds could expend energy to move to other sections of the same ponds or other areas in South San Francisco Bay) on salt pond associated wildlife other than waterfowl (e.g.; shorebirds, grebes, great blue heron, and egrets) compared to no disturbance under Alternative 1 but the impact would likely be minor and short-term. These birds might move when they see hunters boating to the blinds, walking the levees (only allowed in Ponds A5, 7 and A8N), driving to the ponds (levees to Ponds A2E, AB1 and A3W), and when shotguns are fired. Because of the wide open nature of the levees, waterfowl would be able to see hunters and/or their vehicles on the levees and move off before the hunters come within shooting distance.

Under the existing Refuge Hunt Plan, Ponds R1 and 2 (which are smaller than the subject ponds) are used by hunters on a walk in basis but blinds in the ponds have never been used. While on patrol of these ponds during the waterfowl hunting season as a Refuge Law Enforcement Officer, I observed wildlife's (both waterfowl and non waterfowl) reaction to hunters walking, driving the law enforcement vehicle on pond levees, and attempting to hunt from the pond levees. The majority of these ponds had as high density of bird use in the areas of the ponds more than approximately 100 feet from the levees as the ponds that did not have hunting and were of similar salinity. Waterfowl and non huntable species (grebes, heron, egrets, shorebirds) that were approached by hunters on the levees would fly or swim to the unoccupied sections of the levees or beyond the 100 foot from the levees. It is expected that the ponds that are subject to hunting from levees in this alternative would have a similar impact to that observed on the Ravenswood Ponds.

Under this alternative, hunters would use electric or non-motorized boats to access the established blinds in the ponds. This could disturb some wildlife which would expend energy by moving to another part of the same pond or another area in the South San Francisco Bay. The use of non-gas powered motors would eliminate water quality impacts from these boats. Hunters would also be encouraged to use dogs to retrieve downed waterfowl. They would keep the dog(s) under control at all times. These dogs would be in a vehicle or on a leash until they are on the ponds as a part of the hunt or on

the levees (Ponds A5, 7 and 8N only) as a part of the hunt. Refuge Law Enforcement Officers and California Department of Fish and Game Wardens have reported that hunting dogs used in the South San Francisco Bay are kept under strict control at all times and rarely chase waterfowl or other wildlife. Any hunter who allows his/her dog to disturb wildlife is not well received by other hunters who do not want waterfowl disturbed on the ponds that they are hunting. Law enforcement officers and other hunters quickly encourage owners with uncontrolled dogs to leave (Personal communication with Refuge Law Enforcement Officers and California Department of Fish and Game Wardens as well as the author of this Environmental Assessment). However, any disturbance of wildlife by boats and/or dogs would be more than that which would occur under Alternative 1 which would not allow boats or dogs on these ponds.

Similar to hunting on Ravenswood ponds, hunting from the Ponds A5, 7 and 8N would include hunting over tidal marsh and sloughs. None of the marsh around these ponds is endangered species habitat. The marshes and sloughs are California State Lands property which is open to hunting at this time. Therefore, allowing hunting of this area from the levees would not increase hunting opportunities beyond what exists currently nor would the impacts be different than currently exists. Because waterfowl move away from hunters on levees, this type of hunting is expected to be infrequent but is allowed to accommodate hunters without access to boats on the ponds. Hunting from the levees would be monitored by Refuge Law Enforcement Officers during the season and adjustments made if necessary.

Refuge's hunters would be restricted to using the same blinds that were established by Cargill (except for Ponds A5, 7 and 8N which also allows hunting from levees). Under Cargill's Hunt Program, California State Fish and Game Wardens reported that these ponds were so large compared to the number of blinds in the ponds, most of the waterfowl and non-huntable species did not react to hunters and their activities (personal communication with Fish and Game Wardens). Of the few that did react, some flew from the ponds but the majority swam away or flew a short distance to another part of the pond.

Accidental and illegal take of wildlife other than waterfowl (e.g.; shorebirds, grebes, great blue heron, and egrets) could occur but would be incidental and not measurable in the population of the species concerned. Illegal activity would likely not be more than what currently occurs on other parts of the Refuge that are already open to public hunting. There are no reported cases of wildlife take other than waterfowl in the areas of the Refuge that are currently open to waterfowl hunting and no reports of impact to wildlife other than waterfowl in these ponds under Cargill's more extensive hunt program. The potential for illegal take would be minimized with law enforcement during the waterfowl season.

Under this alternative, the Hunting Program would be monitored by taking information on number of hunters and harvest information conducted by Refuge law enforcement staff. Enforcement staff would also monitor for compliance with laws and regulations, and impacts to non-huntable wildlife. The Refuge managers would continue to be in

contact with local governments adjacent to the proposed hunt areas to determine if there are any conflicts with existing users. The Refuge conducts snowy plover surveys and would close any ponds to hunting that contain this species. The Refuge would continue to inventory bird populations through USGS pond surveys and the mid-winter waterfowl surveys. This information would be compared to data from years with the Cargill hunt program and the recent years without hunting to determine if the implemented program is providing quality hunting opportunities for the public, causing conflict with other users and/or impacting bird populations or habitat. Adjustments to the hunt program would be made to correct unanticipated negative impacts.

In summary there would be more impact on wildlife other than waterfowl than under Alternative 1 because hunting could cause some birds to expend energy to move to other sections of the same ponds or other areas in South San Francisco Bay. There would be less impact than that which occurred under Cargill's hunt program because the ponds would be open to hunting fewer days per week and two fewer ponds would be open to hunting. Hunter density would be similar or less than Cargill's hunt program because hunters would be limited to the same blinds as existed under Cargill's hunt program, because waterfowl would be more evenly distributed among the ponds, access to the ponds would be more difficult on certain ponds that would not be accessible by vehicle. There would be a greater possibility of impact to wildlife other than waterfowl under this alternative than Alternative 1, the No Action alterative which would not open the ponds to hunting. There would be less potential for negative impacts to wildlife other than waterfowl under this alternative than under Alternative 3, the Waterfowl Hunting on All Ponds Alternative which opens more ponds to hunting. Negative impacts to wildlife other than wildlife under this alternative are expected to be minor and short term. Negative impacts to threatened and endangered species are not expected.

<u>Alternative 3:</u> Waterfowl Hunting on All Ponds

Under this alternative, all of the recently purchased ponds would be open to waterfowl hunting. Hunting would be allowed for seven days each week following regulations set annually by the California Department of Fish and Game, (See Chapter II for complete explanation of hunt program for this alternative). This would result in more area open for hunting than the No Action Alternative (Alternative 1) the Waterfowl Hunting on Selected Ponds Alternative (Alternative 2) and that which was open to hunting under the Cargill hunting program.

There would be a small, temporary decline on Refuge waterfowl populations but no noticeable impact on Pacific Flyway waterfowl populations.

A. Impacts on waterfowl population.

Under this alternative, a small, temporary decline in the Refuge waterfowl population could occur because of the direct loss of individual birds shot by hunters as compared to Alternative 1 which has no hunting. Because the ponds would be open to hunting seven days a week, waterfowl would not be able to use the ponds as sanctuary four days a week

as under Alternative 2 and seven days a week as under Alternative 1. This would result in fewer huntable birds on the open ponds for hunt days, a poorer quality hunt than under Alternative 2 and less opportunity for birds to use the ponds as a sanctuary.

The number of waterfowl harvested is expected to be greater than under this alternative than under the Cargill hunt program and Alternative 1 and 2 because more ponds would be open to hunting for more days per week. However, it is expected that the viable populations of waterfowl would continue to be maintained under this alternative and there would be no measurable effect on Flyway waterfowl populations. There would be no measurable effect on Flyway waterfowl populations. Because annual Pacific Flyway harvest regulations are designed to ensure that viable populations of waterfowl are sustained over the long term, this alternative would not have any measurable impact on viable populations of waterfowl species as long as regulations are enforced on the Refuge. Wildlife populations would continue to be monitored under this alternative. Monitoring would consist of Mid-winter waterfowl surveys, snowy plover surveys and law enforcement monitoring as described in Alternative 2.

The majority of the salt ponds on the Refuge outside of the recently acquired ponds would be closed to hunting and would continue to provide sanctuary for waterfowl. All hunting regulations would be enforced on the ponds. The regulations are established each year to allow hunting to continue in a way to prevent substantial negative impact to Flyway populations of waterfowl.

Impacts on social values.

Because more ponds would be opened to waterfowl hunting, the Refuge would be providing greater opportunities to the public for hunting in the South San Francisco Bay. There would be more hunting opportunity than was available under the Cargill hunting program, Alternative 1 the No Action Alternative and Alternative 2 the Waterfowl Hunting on Selected Ponds Alternative.

Opening all the recently acquired ponds to waterfowl hunting would cause considerable conflict with the non hunting public and adjacent landowners. In addition to the ponds that are open to hunting in Alternative 2, Ponds A1, A2W, A22, A23, SF-2, R3, R4, R5 would be open to waterfowl hunting under this alternative (Figure 3).

Waterfowl hunting would be allowed in the areas with the greatest visibility by the non-hunting public. Ponds A1 and A2W were hunted under Cargill ownership. These ponds were very visible from the Shoreline at Mountain View Park's Bay Trail and the Charleston Slough Trail (Figure 3). These trails receive approximately 300,000 visitors per year. There were numerous conflicts and complaints by the non-hunting public about hunting in these two ponds. By allowing hunting on these two ponds, there would be substantially greater user conflict when compared to Alternatives 1 and 2 and it would not be supported by the City of Mountain View.

Pond A22 is bordered on one side by a computer company business development (Lam Research). It is also visible from the Refuge's Warm Springs trail which is used mostly by workers in the business development on work week days. Pond A23 is not visible by the public except passing trains using the Union Pacific tracks (Amtrak and Altamont Commuter Express trains) (Figure 1). These ponds were not open under Cargill's hunting program. Under this alternative, these ponds would be open to hunting and therefore, there would be more conflict with the non-hunting public and the adjacent business developments when compared to Alternatives 1 and 2.

Pond SF-2 is immediately adjacent to Highway 84, the congested highway approach to the Dumbarton Bridge which is the southern most bridge crossing in San Francisco Bay (Figure 3). A portion of Pond R3 is adjacent to a computer company business development (Sun Micro Systems) and Bayfront Expressway, a congested feeder road between Highway 84 and Highway 101. Ponds R4, R5, RS5 are adjacent to the Bayfront Expressway and visible from the Menlo Park Bayfront Park. Bayfront Park is used by walkers, joggers, and bicyclist and to a lesser extent, birdwatchers and photographers. It is less developed and receives less use than the recreational areas adjacent to the ponds in Palo Alto, Mountain View and Sunnyvale. These ponds have not been hunted in the past but would be open to hunting under this alternative. There would be substantial conflict with the non-hunting public, commuters, and adjacent business developments over hunting these ponds. This conflict with the non-hunting public may decrease the quality of the experience for the hunter.

In addition to the area open to walk-in hunting in Alternative 2, waterfowl hunting of Salt Ponds A22, A23, R3, R4, R5, SF-2 and S5 would be allowed on a walk-in basis. Hunters would be able to access Ponds A22 and A23 from the Refuge gate off Cushing Parkway in South Fremont (Figure 3). This would make them in close contact with employees at the business park. Walk-in access to Ponds R3, R4, R5 and S5 would be through the Refuge gate on Bayfront Expressway in Menlo Park (Figure 3). This would make them in close contact with employees from the business park and the thousands of commuters who pass this access gate each day. Walk-in access to Pond SF-2 would be off the access road just south of the west end of the Dumbarton Bridge, Highway 84. The close contact among business park employees, commuters on the urban highways and hunters with shotguns, dead waterfowl and hunting equipment is predicted to cause substantial conflict compared to Alternatives 1 and 2.

The Refuge provides approximately 4 docent-led tours a month. Currently, these tours are done off the Refuge in an area that overlooks the Ravenswood Ponds. If the tours were expanded to include some of these ponds, there may be an unacceptable conflict between the hunters and participants on the guided tours. The tours would be discontinued during the hunting season but could be continued the rest of the year.

This would allow the Refuge to provide additional waterfowl hunting opportunities to the public in the South San Francisco Bay. This alternative would likely be supported by some sportsmen's organizations and individuals interested in expanding hunting opportunities on National Wildlife Refuges and in San Francisco Bay. It would be

opposed by anti-hunting organizations and some members of the public who are not supportive of hunting and/or are commuters, adjacent landowners and recreational users of adjacent lands.

In summary, there would be more conflict with adjacent landowners and the non-hunting public under this alternative than existed under the Cargill hunt program because the two most controversial ponds that were open to hunting under Cargill ownership would be open as well as ponds that were not open to hunting under Cargill ownership. Additional conflict would result from the greater contact with commuters and employees of nearby business park at those gates that would be used to access the ponds on a walk-in-basis.

There would be more conflict than under Alternative 1 in which there would be no waterfowl hunting in any of the subject salt ponds and Alternative 2 which would open fewer ponds to hunting and for only 3 days a week. Because this alternative provides for more waterfowl hunting than the other two alternatives is would most likely receive the most support from the hunting public. It is likely to be opposed by anti-hunting organizations.

C. Impacts on wildlife other than waterfowl

Threatened and Endangered Species

The Federally listed endangered or threatened species known to use the affected salt ponds are California least terns, Western snowy plovers which nest and winter on ponds which are mostly dry (Ponds A22, A23, SF-2, R3 and R4 have had nesting and wintering plovers at least one year out of the past five years) and rarely brown pelicans in the winter.

As is expected with Alternative 1 and 2, no negative impact on the California least tern is expected under this alternative. However, ponds that are being opened to hunting under this alternative are used in some years by wintering snowy plovers.

Western snowy plovers nest and winter on ponds which are mostly dry. Ponds A22, A23, SF-2, R3 and R4 have had nesting and wintering plovers at least one year out of the past five years. The Western snowy plovers generally would only be present on ponds that would be dry or with very limited water in the dredge channel along the inside edges of the levees. Ducks do not normally use dry ponds and therefore would not be subject to hunting pressure. Some of the ponds that have been used for nesting and wintering habitat are being proposed for waterfowl hunting in this alternative.

Surveys for snowy plovers would be conducted. If a year is encountered such that any of the ponds are dry enough to become suitable plover habitat, they will be closed to hunting. No impact on snowy plovers is expected under this alternative as none is expected under Alternative 1 and 2.

Like Alternative 2, no adverse impacts to brown pelicans are expected under this alternative, however, the slight chance that a brown pelican would be present or fly over one of the salt ponds proposed to be open to hunting does exist. Because ponds will be open to hunting compared to no hunting under Alternative 1, though the chance of impacts is slight, there is a greater chance of impacts to pelicans under this alternative than Alternative 1. Because more ponds would be open under this alternative than Alternative 2, there is a slightly greater chance of impacts with this alternative than Alternative 2. In order to reduce to inconsequential any disturbance to brown pelican, and eliminate the potential for take on ponds open to hunting, law enforcement activity would be heightened during the waterfowl season. Additionally, the UGSG surveys of the ponds will continue as part of the monitoring program for the ISP. These data will be assessed annually by the Refuge Manager. If brown pelican observations increase substantially on any of the ponds, the potential for disturbance will be re-evaluated and the hunting program modified to eliminate any negative impacts. USGS monitors will be put on "heightened awareness" during the hunting season and instructed to report any brown pelican disturbance to the Refuge Manager.

None of the habitat for the California clapper rail and the salt marsh harvest mouse is found in the salt ponds that are the subject of this alternative. Strips of salt marsh which are habitat for the rail and mouse are found on the outside of the some of the salt pond levees. The endangered California clapper rails are most sensitive to disturbance during their breeding season, February 1 through August 31st. The hunting season is outside the rails breeding season. These areas of marsh most of which are not owned by the Refuge are already open for waterfowl hunting. In order to avoid potential trampling of marsh habitat or disturbance by hunters or their dogs, hunters would not be allowed to hunt on foot along the levees of ponds that are bordered with salt marsh vegetation. The pond levees that have suitable salt marsh vegetation along their edges (A1, A2W, AB1, AB2, A3N, R4 and R3) will be closed to walking hunters. Hunters would only be allowed to hunt from existing blinds on the interior of these ponds which would only be accessed via boats that are moored at designated places within the pond. As is expected in Alternatives 1 & 2, no impact to the rail and mouse is expected by this alternative.

Wildlife Other Than Threatened, Endangered Species and Waterfowl

This alternative would have the potential for disturbance of salt pond associated wildlife other than waterfowl (e.g.; shorebirds, grebes, great blue heron, and egrets) than under Alternative 1 & 2 but any disturbance would likely be minor and short-term. Negative impacts (birds expend energy to move to a different part of the same pond or to another area of South San Francisco Bay) would likely be from disturbance associated with waterfowl hunting and would depend on hunter density. Hunter density is expected to be less than existed under Cargill ownership and Alternative 2 because more ponds would be open to hunting and the hunters would be spread over a larger area. Also, access to these ponds would be more difficult than under Cargill ownership because some ponds that were open to land vehicle access under Cargill would be accessible only by walking.

As with Alternative 2, incidental and illegal take of wildlife other than waterfowl could occur but would be incidental and not measurable in the population of the species concerned but could still be greater than under Alternative 1 which does not allow hunting.

In summary there would be less impact on wildlife other than waterfowl than that which occurred under Cargill's hunt program and Alternative 2, which in itself has little impact on non-huntable wildlife, because hunting density and therefore hunter disturbance would be spread over a larger number of ponds. There would be a greater possibility of impact to wildlife other than waterfowl under this alternative than Alternative 1, the No Action Alterative which would not open the ponds to hunting. However, negative impacts to wildlife other than waterfowl under this alternative are expected to be minor and short term.

As with Alternative 2, under this alternative, the Hunting Program would be monitored by taking information on number of hunters and harvest information conducted by Refuge law enforcement staff. Enforcement staff would also monitor for compliance with laws and regulations, and impacts to non-huntable wildlife. The Refuge managers would continue to be in contact with local governments adjacent to the proposed hunt areas to determine if there are any conflicts with existing users. The Refuge conducts snowy plover surveys and would close any ponds to hunting that contain this species. The Refuge would continue to inventory bird populations through USGS pond surveys and the mid-winter waterfowl surveys. This information would be compared to data from years with the Cargill hunt program and the recent years without hunting to determine if the implemented program is providing quality hunting opportunities for the public, causing conflict with other users and/or impacting bird populations or habitat. Adjustments to the hunt program would be made to correct unanticipated negative impacts.

Chapter V: CONSULTATION AND COORDINATION WITH OTHERS

Because of their expertise and/or experience in hunting, hunt programs, hunter/non-hunter conflicts, and/or protection of wildlife and habitat, the following parties were requested to provide comments on an advanced draft of the Refuge's Hunt Plan Amendment for the subject salt ponds or were contacted for verbal input on the plan:

1. California Waterfowl Association
2. Ducks Unlimited
3. California Department of Fish and Game
4. Sacramento National Wildlife Refuge
5. Santa Clara Valley Audubon Society
6. City of Mountain View
7. City of Sunnyvale
8. Santa Clara Valley Water District

The draft environmental assessment, amendment to the Refuge's Hunt Plan and the Compatibility Determination will be made available to the public and interested agencies for review. The final environmental assessment would include any comments received and the Refuge's responses.

Chapter VI: CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis contained in this document, I find that implementation of the proposed action

Would constitute an action significantly affecting the quality of the human environment and therefore recommend an Environmental Impact Statement be prepared.

Would not constitute an action significantly affecting the quality of the human environment and therefore recommend a Finding of No Significant Impact (FONSI) be prepared.

_____ _____

Project Leader Date

Chapter VII: REFERNCES

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Appendix A – Tables and Maps

Table 1. Pond Elevations under Existing and ISP Conditions and Salinity under Existing Conditions

Pond	Pond Area (Acres)	Pond Bottom Elevation NGVD	Existing Average (Year Round) Depth (ft)	Salinity Range (ppt)	Summer					
					Existing			ISP Avg Water Depth (ft)	Change (ISP-Avg) (ft)	
					6-year Average Depth (ft)	Depth Range				6-year Average Depth (ft)
						Min (ft)	Max (ft)			
Alviso Ponds										
A1	277	-1.8	1.8	11-42	1.8	1.3	2.5	1.4	-0.4	1.8
A2W	429	-2.4	1.8	15-43	1.8	1.1	2.6	1.9	0.2	1.8
B1	142	-0.8	1.5	13-41	1.4	0.7	2.2	1.2	-0.1	1.6
B2	170	-0.6	1.3	13-43	1.2	0.5	2.0	1.0	-0.1	1.4
A2E	310	-3.1	1.9	18-43	2.0	1.1	2.7	2.6	0.7	1.9
A3N	163	-1.4	0.6	16-41	0.8	0.0	1.2	**B/S**		0.6
A3W	560	-3.2	1.9	23-44	1.9	1.1	2.6	1.8	-0.1	2.0
A5	615	-0.6	0.7	28-60	0.7	0.2	1.1	1.0	0.3	0.8
A7	256	-0.5	0.6	28-75	0.5	0.0	0.9	0.9	0.4	0.7
A8	406	-3.4	1.6	31-110	1.4	0.6	2.2	**B/S**		1.8
A9	385	-0.2	4.1	11-38	4.1	3.5	4.7	2.2	-1.9	4.1
A10	249	-0.8	3.3	17-45	3.3	2.8	4.0	2.6	-0.7	3.4
A11	263	-1.8	3.5	28-69	3.3	2.5	4.3	3.1	-0.1	3.6
A14	341	0.0	1.4	48-135	0.8	0.1	2.0	0.9	0.1	1.5
A12	309	-2	3.4	35-66	3.1	2.3	4.2	**B**		3.7
A13	269	-1.1	2.3	38-77	2.0	1.2	3.2	**B**		2.7
A15	249	0.7	2.2	40-111	2.1	0.8	2.7	**B**		2.3
A17	131	1.1	1.6	45-137	1.4	0.6	2.5	1.2	-0.3	1.8
A16	243	0.6	2.1	43-122	1.9	1.0	2.8	1.7	-0.2	2.3
A19	265	1.8	2.0	79-290	2.0	-0.2	2.9	**T**		2.1
A20	63	1.8	1.9	87-289	1.7	0.4	2.6	**T**		2.0
A21	147	2.31	1.2	87-304	1.0	-0.1	2.0	**T**		1.5

Notes: S = Seasonal Pond
B = Batch Pond
T = Tidal Pond

Table 1. Pond Elevations under Existing and ISP Conditions and Salinity under Existing Conditions (Concluded)

Pond	Pond Area (Acres)	Pond Bottom Elevation NGVD	Existing Average (Year Round) Depth (ft)	Existing Salinity Range (ppt)	Summer					
					Existing			ISP Avg Water Depth (ft)	Change (ISP-Avg) (ft)	6-year Average Depth (ft)
					6-year Average Depth (ft)	Depth Range				
						Min (ft)	Max (ft)			
Ravenswood Ponds										
1	445	2.1	0.5	35-326	0.4	-2.0	2.9	0.9	0.5	0.8
2	145	2.0	1.6	64-306	1.4	0.1	2.9	0.8	-0.6	1.7
3	273	2.2	1.2	145-320	0.9	-0.4	2.4	0.8	-0.1	1.6
4	297	2.8	0.4	88-341	0.0	-1.8	1.5	0.7	0.6	0.7
5	31	2.5	0.6	96-340	0.3	-1.6	1.7	1.0	0.7	1.0
S5	29	2.5	-2.5					1.2		
SF2	242	2.6	1.0	76-316	1.0	0.3	2.1	0.7	-0.3	1.0

Notes: S = Seasonal Pond
B = Batch Pond

Table 2. Mid-Winter Waterfowl Counts for San Francisco Bay (1989 - 2003)				
Year	**San Francisco Bay (Total)**	**South Bay (Total)**	**South Bay – Salt Ponds**	**South Bay– Open Bay**
1989	186,097	98,294	74,921	23,373
1990	252,276	75,290	45,506	29,784
1991	164,155	69,312	45,765	23,547
1992	229,907	76,510	31,762	44,748
1993	117,947	66,079	29,701	36,378
1994	191,887	72,234	33,463	38,771
1995	89,638	32,653	28,510	4,143
1996	Data not available			
1997	114,335	36,347	15,008	21,339
1998	207,884	109,207	50,685	58,522
1999	262,170	57,977	31,797	26,180
2000	169,950	86,378	47,709	38,669
2001	347,889	189,618	71,183	118,435
2002	175,292	85,405	68,176	17,229
2003	143,600	74,959	61,851	13,108

Table 3. Waterfowl Counted on Alviso Ponds During 2000 - 2003 Mid Winter Waterfowl Surveys

		YEAR OF SURVEY					
Pond No.	**Acres**	**2000**	**2001**	**2002**	**2003**	**Average**	**Average/acre**
Alviso Ponds with Previous Hunting Leases							
A1	277	844	2643	78	6581	2537	9.2
A2W	429	1829	4273	2674	1748	2631	6.1
A2E	310	560	1889	3390	806	1661	5.4
AB1	142	40	1000	540	2738	1080	7.6
AB2	170	206	1450	730	634	755	4.4
A3N	163	0	285	244	1201	433	2.7
A3W	560	2265	1269	4051	1386	2243	4.0
A5	615	19	250	122	79	118	0.2
A7	256	6	20	2	200	57	0.2
A8	406	37	0	65	113	54	0.1
Subtotal	**3328**	**5806**	**13079**	**11896**	**15486**	**11567**	**3.5**
Alviso Ponds without Hunting							
A9	385	7342	14506	4850	8620	8830	22.9
A10	249	3972	7265	1140	3673	4013	16.1
A11	263	0	88	372	230	173	0.7
A12	309	0	41	20	0	15	0.0
A13	269	2	19	10	0	8	0.0
A14	341	0	185	121	55	90	0.3
A15	249	29	65	357	0	113	0.5
A16	243	14	0	0	1	4	0.0
A17	131	5	56	19	13	23	0.2
Subtotal	**2439**	**11364**	**22225**	**6889**	**12592**	**13268**	**5.4**
Total	**5767**	**17170**	**35304**	**18785**	**28078**	**24834**	**4.3**

Table 4. Anticipated Effects of Alternatives

Issues	Alternatives*		
	1	2	3
Impact on Refuge waterfowl population	+	-	-
Impact on Flyway waterfowl population	0	0	0
Impact to non-target non Threatened & Endangered (T&E) wildlife	+	-	-
Impact to non-target T&E wildlife	0	0	-
Area open to Waterfowl Hunting	--	+	++
Wildlife-oriented recreation opportunities	-	+	+
Impact to non-hunting public	+	-	--
Degree of controversy	-	-	--
Public safety	0	0	0

Key (Expressed as changes to population or amount)

Minor Benefit	+	No Effect	0	Minor Detriment	-
Moderate Benefit	++			Moderate Detriment	--
Major Benefit	+++			Major Detriment	---

- Alternative 1: No Waterfowl Hunting on Salt Ponds (No Action)
- Alternative 2: Waterfowl Hunting Confined to Certain Ponds (Proposed Action)
- Alternative 3: Waterfowl Hunting on All Ponds

Table 5. Comparison of Each Alternative with Hunting Program under Cargill Ownership

Acreage of Pond Area Open to Hunting*

Cargill	3,328 acres
Alt. 1	0 acres
Alt. 2	2,622 acres
Alt. 3	5,000 acres

* Refuge purchased 5,500 acres of Cargill land in fee title. Approximately 5,000 acres are pond area and approximately 500 acres are upland areas such as pond levees and small pieces of adjacent mudflats and creeks that were artifacts of the land surveys and were not considered for inclusion in the hunt program. The acreage listed for Alternatives 2 & 3 would be in addition to the 7,663 acres that are already open to hunting in this 30,000-acre National Wildlife Refuge.

Days per Week Ponds Would Be Open to Hunting

Cargill	Some ponds open 7 days a week, some open 3 days a week
Alt. 1	0 days per week
Alt. 2	3 days per week (other parts of Refuge open 7 days a week)
Alt. 3	7 days per week

Hunters Legally Able to Hunt on Ponds

Cargill	Only hunters having Cargill leases or subleases (175 hunters/year)
Alt. 1	No hunters
Alt. 2	All hunters with valid state license, duck stamps, Special Use Permit
Alt. 3	All hunters with valid state license, duck stamps, Special Use Permit

Method of Access to Ponds by Hunters

Cargill	Drive private vehicles to ponds, use motorized (gas & electric) and non-motorized boats to access blinds in ponds
Alt. 1	No access because no hunting would be allowed
Alt. 2	Some ponds accessed by private vehicles, some accessed by foot, use motorized (electric only, no gas powered) and non-motorized boats to access blinds in ponds
Alt. 3	Some ponds accessed by private vehicle, some accessed by foot, use motorized (electric only, no gas powered) and non-motorized boats to access blinds in ponds

Able to Use Hunting Blinds on Ponds and Small Private Boats to Access these Blinds

Cargill	Yes, use existing blinds
Alt. 1	No because no hunting would be allowed
Alt. 2	Yes, use existing blinds
Alt. 3	Yes, use existing blinds or if blinds do not exist in pond, build new blinds as allowed in Special Use Permit

Number of Ponds Open to Hunting with Low Salinity Attractive to Waterfowl

Cargill	2 ponds
Alt. 1	0 ponds because no hunting would be allowed
Alt. 2	8 ponds**
Alt. 3	8 ponds now but up to 12 ponds eventually would have low salinity after 5 years because Cargill would need this time to lower salinity of Ravenswood Ponds.

** More ponds would have lower salinity under the water management proposed by the Refuge than occurred under Cargill management (See Chapter III, section titled: "Anticipated Management of the Ponds During the Initial Stewardship Period").

Acreage of Sanctuary for Wildlife in Refuge

Cargill	17,509 acres (includes 2,172 acres of 5,500 acres of lands that were owned by Cargill that were not open to hunting)
Alt. 1	22,337 acres because no hunting would be allowed on 5,500 acres
Alt. 2	19,715 acres because 2,622 acres of 5,500 acres would be hunted
Alt. 3	17,337 acres because 5,000 of 5,500 acres would be hunted